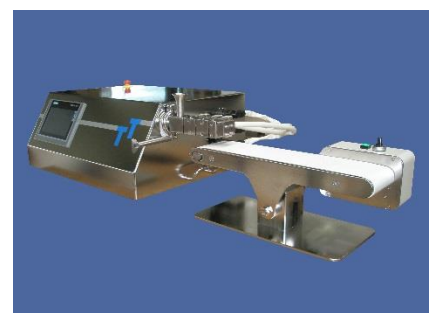
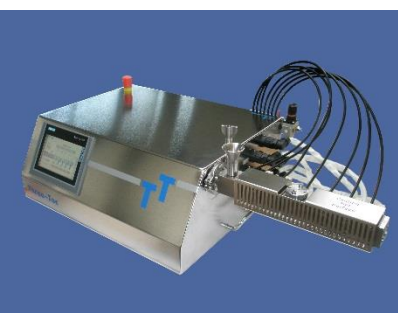


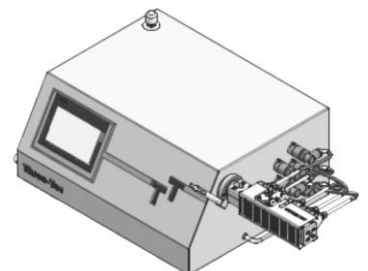
# Three-Tec TT

## Miniature extruder

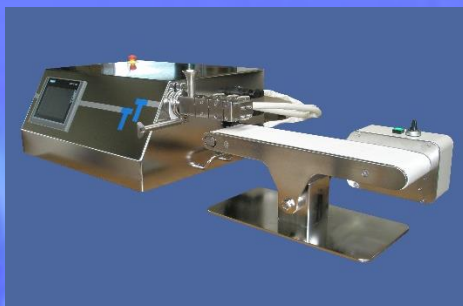
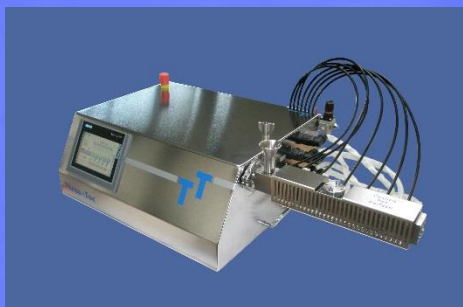
For extruding medium to very small volumes



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# Miniature extruder



## **Miniature extruder: advantages**

In early formulation development phases, only low volumes of an active agent often are available on the one hand. On the other hand, many formulation attempts are required in order to achieve the ideal preparation. Therefore, an extrusion option for the smallest scale is extremely advantageous and is also important for the fields of food, cosmetics, paint, and plastics industry, along with the pharmaceutical industry.

## **Structural advantages**

Low consumption of substances due to the miniaturisation; nevertheless, larger volumes can be produced as well.

Our extruders are characterised by a wide screw diameter range (5, 9, 12, 16 and 18 mm) and a wide range of L:D ratios (15:1 – 40:1).

Quick assembly and disassembly in order to increase the sample throughput by means of tri-clamp and bayonet connections.

The barrel consists of one piece so that there are no leakage-related issues. It is also possible to use a two-part barrel. Steep temperature gradients between the segments are made possible by the notches within the barrel.

The extruders are designed for easy cleaning and simple cleaning validation.

Freely configurable screws allow for the individual adaptation to the respective extrusion process.

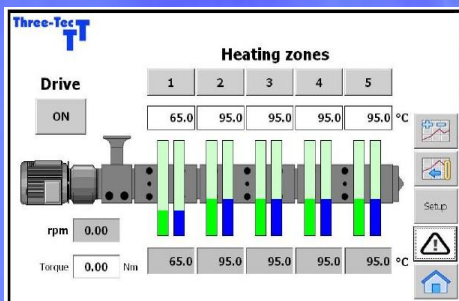
The very compact devices are characterised by low space requirements and can be installed easily in isolators in the event of highly efficient active agents.

The miniature extruders can be transported easily due to their low weight and the control unit required for collecting all important data is compact.

Calender, discharge conveyor belts, cutting heads, granulators, spheronisers, and optimised nozzle plates are available for all extrusion applications.

Patented

## Miniature extruder



### ***Self-explanatory control panel***

The intuitively designed control panel with Siemens electronic modules in the background provides for the highest levels of user-friendliness and comfort.

With volumetric and gravimetric metering devices, it is possible to dose into the barrel from the top or from the side.

Liquids can be added into the barrel at any position, for example using an HPLC pump.



### ***Extremely good mixing properties***

The test in our test laboratory with dipper wax showed that our extruders are characterised by extremely good mixing properties.

This is also confirmed by tests performed at a university. It was possible to perfectly demonstrate the uniform distribution of the active agent within the extruded product by means of the subsequent analyses of the extruded products using an electron microscope, as well as by subjecting the extruded products to rays of light.



### ***The modular design of the screw***

If you want even higher mixing and kneading properties, we offer modular screws with specific conveyor segments for kneading, mixing, compressing, pressing, relaxing, or even backwards conveying.

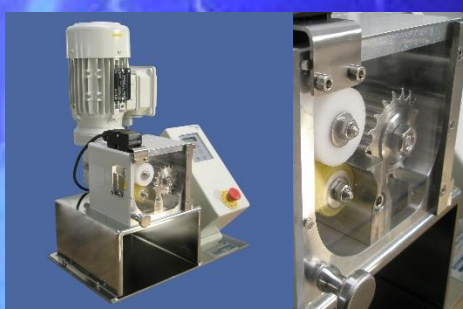
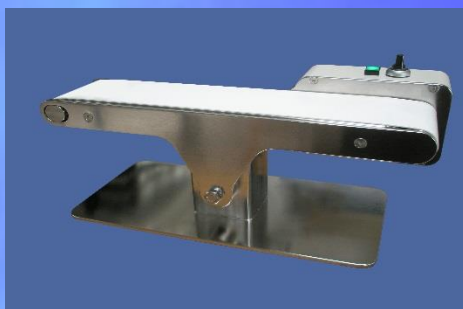
The modular components can be replaced and re-configured at any time. This allows for a very flexible and ideal adaptation to different extruding assignments.

There are also fix screws with an end-to-end pitch without any mixing of kneading elements or screws with elements according to the customer's request that can be made from one piece for easy cleaning.





# Miniature extruder accessories



## Feeders

In order to fill the extruder with powders or granulates, a broad selection of different volumetric or gravimetric single- and dual-shaft feeders are available. Lateral dosing directly into the barrel is possible as well.

## Conveyor belt

The conveyor belt was designed for gentle transportation of the extruded products. In this, the extruded products slowly cool down and can be supplied to the granulator, for instance. The height and the angle of the conveyor belt can be adjusted. It is made of stainless steel 1.4404 /316L and can be disassembled and cleaned easily. The conveyor speed is infinitely variable using a potentiometer.

## Spheroniser

Optionally, our Spheronisers are equipped with an electrically heated hopper jacket or a hopper jacket that is heated by an external tempering device. They are designed for batch volumes of 5 to 250 grams. Different friction discs can be produced according to the customer's request.

## Granulator / head chipping

The granulator is used in order to directly granulate the string of extruded products after the water bath or the conveyor belt. The granulate length can be adjusted by means of different cutting knives or infinitely by means of a feed motor (granulate lengths between 1 and 5mm). The extruded product can also be supplied to the granulator from the top automatically due to gravitation.

The granulation can be performed directly at the nozzle plate by means of head chipping. This is specifically appropriate for brittle materials that cannot be transported without breaking.

## Water bath

For string cooling before cutting or other processes. The water bath is equipped with hold-down brackets and separator brush. The water can be drained by means of a shut-off valve.